Medtronic Physio-Control
LIFEPAK 12

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LIFEPAK 12

INVENTORY

Left Side Pocket
1 ECG Cable (Main Trunk Cable & 4-wire Limb Lead Cable) (consider pre-attached electrodes)
20 Electrodes

Right Side Pocket
1 Quick-Combo Electrical Therapy Cable
1 Battery

Top Pocket
1 6-wire Precordial Lead Cable (consider pre-attached electrodes)
1 SpO_2 Sensor & Cable (optional)

Back Pocket
2 Adult Quick-Combo, Quick-Combo Ready Pak, or Quick-Combo Edge (*Preferred*) Defibrillation Pads
1 Pediatric Quick-Combo Pads
1 Adult BP Cuff (optional)
1 Pediatric BP Cuff (optional)

*Addendum to EMS Operations Manual (1997) *Appendix B Freightliner / Ford Wheeled Coach Inventory* (6/97)

Compartment I

Add
2 Adult Quick-Combo, Quick-Combo Ready Pak, or Quick-Combo Edge (*Preferred*) Defibrillation Pads *(MICU Only)*
1 Pediatric Quick-Combo Pads *(MICU Only)*
1 Spare 12-Lead ECG Cable (Main Trunk Cable, 4-wire Limb Lead Cable, & 6-wire Precordial Lead Cable) *(MICU Only)*
1 Spare Quick-Combo Electrical Therapy Cable *(MICU Only)*
2 Rolls 100mm ECG paper

Modify
40 Electrodes *(MICU Only)*
1 Quick Pace Pads (if using LP10) *(MICU Only)*
1 Spare Quick Pace Cables (if using LP10) *(MICU Only)*
1 Spare LP10 ECG Cable (if using LP10) *(MICU Only)*
2 Rolls 5mm ECG Paper (if using LP10) *(MICU Only)*

LIFEPAK 12

FACT SHEET

SPECIFICATIONS*

Physical Characteristics

Weight	13.3lbs (basic defibrillator/monitor with QUIK-COMBO cable only – no batteries) 16.7 lbs (with two LIFEPAK NiCd batteries) 16.1 lbs (with two FASTPAK or FASTPAK2 batteries) 18.9 lbs (with two LIFEPAK SLA batteries)
Size	12.5” high by 15.3” wide by 8.5” deep

Environmental

Temperature:		
	Operating	32° to 122° F
	Storage	-40° to 158° F (followed by one hour temperature stabilization in operating range)
Humidity:		5 to 95% non-condensing
Altitude:		
	Operating	To 15,000 ft
	Standby	To 18,000 ft
Atmospheric pressure, Operating:		Ambient to 429 mmHg (0 to 15,000 ft)

*all specs are at 77° F unless otherwise noted

Power

Batteries: NiCd (FASTPAK, FASTPAK2, or LIFEPAK NiCd)
SLA (LIFEPAK SLA)

Two fully charged batteries will provide the following prior to shutdown (LCD or EL display types):

FASTPAK or FASTPAK2:

Monitoring minutes	60-110 (LCD)	43-81 (EL)
360j discharges	45-80 (LCD)	40-72 (EL)
Monitoring plus pacing minutes (100ma, 60 ppm)	60-105 (LCD)	42-75 (EL)

LIFEPAK NiCd:

Monitoring minutes	85-155 (LCD)	62-114 (EL)
360j discharges	60-110 (LCD)	54-99 (EL)
Monitoring plus pacing minutes (100ma, 60 ppm)	85-145 (LCD)	60-104 (EL)

LIFEPAK SLA:

Monitoring minutes	100-180 (LCD)	73-132 (EL)
360j discharges	85-145 (LCD)	76-131 (EL)
Monitoring plus pacing minutes (100 ma, 60 ppm)	100-170 (LCD)	71-122 (EL)

Performance characteristics

Defibrillator and Cardioversion

Energy select: 2-10, 20, 30, 50, 70, 100, 150, 200, 300 and 360 joules

Charge time to 360 joules is <10 sec typically

Selected Parts Numbers

Medtronic Physio-Control 1-800-442-1142

Battery and Power Accessories

Battery Support System 2 wall mount bracket	3010932
Battery Support System 2	BSS2
FASTPAK battery	09-10424
FASTPAK 2 battery	3009375
LIFEPAK NiCd battery	3009376
LIFEPAK SLA battery	3009378
AC Power Adapter & AC Input Power Cord	LP12 PA-AC
DC Power Adapter	LP12 PA-DC

Combination Pad Accessories

QUIK-COMBO Therapy Cable	3006570
Adult QUIK-COMBO Pads	806086
Pediatric QUIK-COMBO Pads	3006478
Adult QUIK-COMBO REDI-PAK Pads	3008497
Adult QUICK-COMBO EDGE Pads	3010188-005

ECG Accessories

12-lead ECG cable	
Main Trunk Cable	805265-18
4-wire limb lead attachment	805265-03
6-wire precordial lead attachment	805265-04

Carrying Case & Accessories

Carrying Case – LP12 only	3011086-00
Carrying Case – with AC/DC Power Adapter	3011086-01
Base (replacement)	3010265
Shoulder strap (replacement)	3010268
Front left pouch	3010266
Top pouch	3010267
Back pouch – small	3011087-00
Back pouch – large	3011087-01
Front cover	3011085

Supplies

Recorder paper, 50 mm	804700
Recorder paper, 100 mm	805319

Literature

LIFEPAK 12 Operating Instructions	3010012
LIFEPAK 12 Service Manual	3010013
LIFEPAK 12 In-service Video	3011208

LIFEPAK 12

MAINTENANCE AND TESTING SUMMARY

General Maintenance and Testing

Periodic maintenance and testing of the LIFEPAK 12 defibrillator/monitor and accessories are important to help prevent and detect possible electrical and mechanical discrepancies. If testing reveals a possible discrepancy with the defibrillator or accessories, refer to the "General Troubleshooting Tips" table on page 9 of this manual. If the discrepancy cannot be corrected, immediately remove the device from service and contact the EMS Duty Officer. The EMS Duty Officer will arrange service with the Medtronic Physio-Control service representative.

Self Test

Each time you turn on the defibrillator/monitor, it performs a Self-Test. If the defibrillator/monitor detects a failure, the Service LED will light. Should this occur, turn the device off and then on again, and allow the LP12 to repeat the Self-Test. If the Service LED remains lit, immediately remove the device from service and contact the EMS Duty Officer. The EMS Duty Officer will arrange service with the Medtronic Physio-Control service representative.

Cleaning

Do not clean any part of this device or accessories with bleach, bleach dilution, or phenolic compounds. Do not use abrasive or flammable cleaning agents. Do not attempt to sterilize this device or any accessories unless otherwise specified in accessory Operating Instructions.

Clean the LIFEPAK 12 defibrillator/monitor, cables, and accessories with a damp sponge or cloth. Use only the cleaning agents listed below:

- Quaternary ammonium compounds
- Isopropyl Alcohol
- Peracetic (peroxide) acid solutions

User Test

The User Test is a functional test of the LIFEPAK 12 and should be performed only as a test and not while using the device during patient care. This test may be performed in place of the daily charging and discharging when the device is configured with the Quick-Combo therapy cable.

Press OPTIONS to access the User Test. When selected, the User Test automatically performs the following tasks:

- Performs Self-Test
- Charges to 10j and discharges internally (this energy is not accessible at the therapy cable connector)
- Prints a Pass/Fail report

If the LIFEPAK 12 detects a failure during the User Test, the Service LED lights and the printed reports indicates that the test has failed. Should this occur, turn the device off and then on again, and repeat the User Test. If the Service LED remains lit, immediately remove the device from service and contact the EMS Duty Officer. The EMS Duty Officer will arrange service with the Medtronic Physio-Control service representative.

If it is necessary to interrupt the User Test, turn the power off and then on again. The test will stop and the device will operate normally. A Pass/Fail report will not print.

Note: During the User Test, all front panel controls (except ON) are disabled. Routinely testing the defibrillator consumes battery power; appropriately maintain all batteries.

Therapy Cable Check

The use of a Quick-Combo 12-Lead Simulator (P/N 806395) is required in order to check and test the Quick-Combo therapy cables for monitoring, defibrillation, cardioversion, and pacing capabilities. This test is recommended to be performed every 6 months, or on a more frequent basis as needed.

Documentation

All daily operator's checks should be documented on the LIFEPAK 12 Operator's Checklist. All therapy cable checks should be documented by attaching any printouts created by the tests. The station/corporation medic coordinator should maintain all documentation for a period of at least two (2) years.

LIFEPAK® 12 defibrillator/monitor Series OPERATOR'S CHECKLIST

Unit Serial No.: _____

Location: _____

This is a suggested checklist to inspect and test this device. Inspection and testing of this device on a daily basis is recommended. You may also consult JAMA, August 22/29, 1990, Vol. 264, No. 8, Table 2 for the Defibrillator Working Group's manual defibrillator checklist.

This form may be reproduced.

Medtronic PHYSIO-CONTROL

Instruction	Recommended Corrective Action	Date / Initials							

Insert a ✔ in the box after completing each instruction.

1 Inspect physical condition for:

Foreign substances	Clean the device.							
Damage or cracks	Contact qualified service technician.							

2 Inspect Power Source for:

Broken, loose, or worn battery pins	Contact qualified service technician.							
Damaged or leaking battery	Discard/recycle battery							
Two fully charged batteries installed	Replace battery.							
Fully charged spare batteries available	Obtain battery.							

3 Check therapy and ECG electrodes for:

Expiration date	Replace if expired.							
Spare electrodes available	Obtain spare electrodes.							

4 Examine accessory cables for cracking, damage, broken or bent parts or pins, and paddle surfaces for pitting. Replace damaged or broken parts.

5 With the battery installed and the device disconnected from ac power, press ON and look for:

Self-test messages	If absent, contact qualified service technician.							
Momentary illumination of each LED and all LCD segments	If absent, contact qualified service technician.							
LOW BATTERY or REPLACE BATTERY messages	Replace the battery immediately.							
Service indicator message	Contact qualified service technician.							
Perform User Test (QUIK-COMBO therapy cable only)	If test failed, repeat. If failed twice, contact qualified service technician.							

6 Check ECG printer for:

Adequate paper supply.	Replace if necessary.							
Ability to print.	If not working, contact qualified service technician.							

GENERAL TROUBLESHOOTING TIPS

Observation	*Possible Cause*	*Corrective Action*
No power when defibrillator/monitor is turned on	Low battery voltage Battery connector pin loose, covered with foreign substance or damage	Replace with fully charged properly maintained battery Remove batter and inspect pins (Clean if foreign object present.) Contact a qualified service technician to replace if bent, cracked, or loose.
Defibrillator/monitor operates but display is blank	Operating temperature is too low or too high Display not operating properly	Replace the battery immediately Contact qualified service technician
CHECK PRINTER message displays	Printer paper jams, slips or misfeeds Printer is out of paper	Reinstall paper Add new paper
No power when power adapter connected	Improper connection between power adapter and defibrillator or power source	Check power adapter connections and cables Check DC power adapter MAINS POWER is set to (ON) and connected to vehicle power Check AC power adapter is connected to AC line power
Service LED illuminates	Device self-test circuitry detects service condition	Continue to use defibrillator or pacemaker if needed Turn device off then on again. **Note this creates a new patient.** If service LED does not clear, remove device from active use Report occurrence of service LED to qualified service personnel
State of charge not displayed when LIFEPAK NiCd battery is in battery well	Battery needs conditioning	Condition the battery. **Refer to battery support system guidelines.**
ECG monitoring problems		Refer to page 3-5 in LIFEPAK 12 manual
Problems with AED operations		Refer to page 4-5 in LIFEPAK 12 manual
Problems with defibrillation/synchronized cardioversion		Refer to page 4-14 in LIFEPAK 12 manual
Problems with pacing		Refer to page 4-16 in LIFEPAK 12 manual
Displayed time is incorrect	Time is incorrectly set	Change the time setting (Refer to page 2-8 in LIFEPAK 12 manual)
Date printed on report is incorrect	Date is incorrectly set	Change the date setting (Refer to page 2-8 in LIFEPAK 12 manual)
Displayed messages are faint or flicker	Low battery power. Out of temperature range	Replace the battery immediately
Low speaker volume	Moisture in speaker grill holes	Wipe moisture from speaker grill and allow device to dry

* From LIFEPAK 12 Operations Manual

Maintenance Schedule

Operation	*Daily*	*After Use*	*As Required*	*3 Months*	*6 Months*	*12 Months*
Inspect defibrillator	**X**	**X**	**X**			
Check that all necessary supplies and accessories are present (e.g. fully charged batteries, and proper inventory)	**X**	**X**	**X**			
Complete Operator's Checklist	**X**	**X**				
User Test (QUIK-COMBO Therapy cable only)	**X**					
Therapy cable monitoring check					**X**	
Therapy cable defibrillation check					**X**	
Therapy cable synchronized cardioversion check					**X**	
Therapy cable pacing check					**X**	
NiCd batteries: Reconditioning (alternate with Shelf Life Test) (SLA optional)				**X**		
NiCd batteries: Shelf Life Test (SLA optional)					**X**	
Preventive Maintenance and Testing (contact EMS Duty Officer to schedule)						**X**
All function checks and tests are explained in more detail on pages 8-3 through 8-9 in the LIFEPAK 12 operations manual. **Battery maintenance, tests and conditioning is explained in the battery support system in this manual and on pages 8-9 through 8-13 in the LIFEPAK 12 operations manual.**						

* From LIFEPAK 12 Operations Manual

BATTERY SUPPORT SYSTEM 2

BATTERY MAINTENANCE GUIDELINES

To maximize BSS2 operation and battery performance and life, observe these guidelines:

Place the BSS2 in the Proper Location

- Place in a dry, well-ventilated area
- Keep at room temperature
- Keep batteries in wells
- Do not place in direct sunlight
- Do not place near a heat source or an air conditioner
- Keep fan vent on back panel unobstructed

Charging batteries at Room Temperature

- Normal temperature range 20º C to 25º C (68º F to 78º F)
- Extreme temperature range 5º C to 35º C (41º F to 95º F)

Charging the batteries at room temperature is preferred to maximize the batteries performance and life. Batteries charged outside the temperature range may not reach a full charge, even if the charging time is increased, and irreversible cell damage could occur.

To charge a battery:

1. Insert a battery into a BSS2 battery well. The CHARGE LED lights and charging begins automatically.
2. READY lights when a battery reaches a full charge. The battery may remain in the battery well until needed. The BSS2 supplies a trickle charge that will prevent overcharge and also maintain the battery at peak capacity.

Rotate Batteries

Rotate all batteries in active use so that they are used with equal frequency. Medtronic recommends that the batteries be rotated after each use.

Condition batteries every three months

Voltage depression is a condition that reduces battery performance. When NiCad batteries repeatedly receive a shallow discharge (not allowed to drain completely between charging cycles), voltage depression occurs. Voltage depression can usually be reversed by conditioning the batteries every three months.

To condition a battery:

1. Insert the battery into any battery well.
2. Press CONDITION for other FASTPAK batteries.
3. READY lights when a battery is fully recharged. The BSS2 automatically recharges a battery that passes the conditioning process.

Perform Shelf Life Testing Every Six Months

Batteries self-discharge when not in use. The actual rate of battery self-discharge depends on:

- Battery age
- Temperature
- Frequency of use
- Length of time in storage
- Physical condition

These factors can combine to significantly increase the battery discharge rate. The self-discharge rate increases as the battery ages.

The shelf life test evaluates the self-discharge rate of a battery. Any battery that fails the shelf life test should be removed from use and delivered to the EMS Duty Officer.

To perform a shelf life test:

1. Complete the conditioning procedure.
2. Remove the battery from the BSS2 and store for 7 days at room temperature.
3. After storage, insert the battery into a battery well and press SHELF LIFE within 3 seconds.
4. Verify that SHELF LIFE LED lights.
5. READY lights when the battery passes the shelf life test and is fully charged. The battery may then be returned to use.

When receiving newly purchased batteries, charge each new battery. Because batteries self-discharge during storage, a new battery may not be fully charged when it is received.

Properly maintained FASTPAK batteries have a useful life of approximately two years. Properly maintained FASTPAK 2 and LIFEPAK NiCd batteries have a useful life up to five years. Properly maintained LIFEPAK SLA batteries have a useful life of up to three years.

Documentation

All stations/corporations with a BSS2 will maintain a Battery Maintenance Log. The Visual Inspection will be completed at each charging. The Reconditioning test and Shelf Life Test for each battery will also be documented on this form. The station/corporation medic coordinator should maintain all documentation for a period of at least two (2) years.

Replacement of Batteries

Any faulty battery should be turned in to the EMS Duty Officer for replacement. New, replacement batteries will be distributed to the stations with county-owned LIFEPAK 12s as described in the current service agreement with Medtronic Physio-Control.

BATTERY SUPPORT SYSTEM 2

When the BSS2 AC power cord is inserted into an AC power receptacle, the BSS2 performs a series of self-diagnostic tests. Power-up testing is indicated by all the BSS2 indicator lights briefly illuminating. If self-testing is successful, all the indicators (except POWER) extinguish. If the BSS2 fails any power-up self-test, SERVICE lights. Remove the device from service and contact the EMS Duty Officer. The EMS Duty Officer will arrange service with the Medtronic Physio-Control service representative

Cleaning

Clean the BSS2 case, battery contacts, batteries, and ac power cord with a damp sponge or towel. The following agents may be used:

- Mild soap and water
- Quaternary ammonium compounds
- Isopropyl alcohol
- Peracetic (peroxide) acid solutions

Fuse Replacement

The BSS2 has two fuses that help provide protection against over current. To replace the fuses, open the fuse carrier door (located in the power-input module) with a flat-bladed screwdriver. Verify that the replacement fuses are the same type and rating as listed in the specifications.

BATTERY MAINTENANCE LOG

For use with the Battery Support System for Physio-Control.

DATE	I.D. NUMBER	BATTERY TEST PERFORMED	BATTERY TEST RESULTS	BATTERY ACCEPTABLE?	
		☐ Faulty ☐ Reconditioning Procedure ☐ Shelf Life Test ☐ Visual Inspection (case not cracked or broken)	Battery Capacity ______ % Shelf Life Test Value ____ Case OK ☐ Case **not** OK ☐	☐ YES	☐ NO Discard Battery
		☐ Faulty ☐ Reconditioning Procedure ☐ Shelf Life Test ☐ Visual Inspection (case not cracked or broken)	Battery Capacity ______ % Shelf Life Test Value ____ Case OK ☐ Case **not** OK ☐	☐ YES	☐ NO Discard Battery
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		☐ Faulty ☐ Reconditioning Procedure ☐ Shelf Life Test ☐ Visual Inspection (case not cracked or broken)	Battery Capacity ______ % Shelf Life Test Value ____ Case OK ☐ Case **not** OK ☐	☐ YES	☐ NO Discard Battery

P/N 806019-00 Technical Service 1(800) 442-1142 USA

BATTERY MAINTENANCE LOG

For use with the Battery Support System for Physio-Control.

DATE	I.D. NUMBER	BATTERY TEST PERFORMED	BATTERY TEST RESULTS	BATTERY ACCEPTABLE?	
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		☐ Faulty ☐ Reconditioning Procedure ☐ Shelf Life Test ☐ Visual Inspection (case not cracked or broken)	Battery Capacity ______ % Shelf Life Test Value ____ Case OK ☐ Case **not** OK ☐	☐ YES	☐ NO Discard Battery

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Troubleshooting

Observation	*Possible Causes*	*Corrective Action*
POWER does not light when the ac power cord is inserted into an ac power receptacle.	Power cord not properly connected.	Make sure that the power cord is securely connected at both ends.
	Blown Fuses	Replace fuses using the procedure described above with the fuses specified.
	Inoperative ac outlet or tripped circuit breaker in building.	Remove the device from service and contact the EMS Duty Officer. The EMS Duty Officer will arrange service with the Medtronic Physio-Control service representative
CHARGE/CONDITION does not light when a FASTPAK battery is installed.	Battery malfunction.	Install a different battery in the same battery well. If CHARGE/CONDITION lights, turn-in the original battery to the EMS Duty Officer for replacement.
	BSS 2 malfunction.	Remove the device from service and contact the EMS Duty Officer. The EMS Duty Officer will arrange service with the Medtronic Physio-Control service representative
READY does not light after hours of charging.	Battery does not charge to full capacity (battery requires conditioning).	Perform the conditioning procedure.
	Battery charged at excessively high or low temperatures.	Perform the conditioning procedure at the correct temperature.
DISCARD illuminates.	Battery is at the end of useful life.	Turn-in the battery to the EMS Duty Officer for replacement.
Battery powers devices for less than the expected time.	Battery needs conditioning.	Perform the conditioning procedure. If the battery is still not performing to expectations, perform a shelf life test.
SHELF LIFE LED does not light.	Conditioned battery was not removed and stored prior to shelf life test.	Condition, remove, and store battery for 7 days prior to shelf life testing.

Battery Specifications

FASTPAK and FASTPAK 2	
Battery Type	Nickel Cadmium
Weight	0.7 kg (1.5 lbs)
Voltage	12Vdc
Capacity	1.2 amp hours
Charge Time (with fully depleted battery)	1.5 hours 7 hours typical, 8 hours maximum
Conditioning Time	
Charging Temperature Range	+5º to 35º C (41º to 95º F)
Operating Temperature Range	0º to 50º C (32º to122º F)
Long Term (>1 day) Storage Temperature Range	0º to 35º C (32º to 95º F)

LIFEPAK NiCd	
Battery Type	Nickel Cadmium
Weight	0.77 kg (1.7 lbs)
Voltage	12Vdc
Capacity	1.7 amp hours
Charge Time (with fully depleted battery)	2.25hours 8 hours typical, 10 hours maximum
Conditioning Time	
Charging Temperature Range	+5º to 35º C (41º to 95º F)
Operating Temperature Range	0º to 50º C (32º to12 2º F)
Long Term (>1 day) Storage Temperature Range	0º to 35º C (32º to 95º F)

LIFEPAK SLA	
Battery Type	Sealed lead acid
Weight	1.4 kg (3.0 lbs)
Voltage	12Vdc
Capacity	2.5 amp hours
Charge Time (with fully depleted battery)	6 hours typical, 12 hours maximum 28 hours typical, 56 hours maximum
Conditioning Time	
Charging Temperature Range	+5º to 35º C (41º to 95º F)
Operating Temperature Range	0º to 50º C (32º to122º F)
Long Term (>1 day) Storage Temperature Range	0º to 35º C (32º to 95º F)